The Examiner's attention is respectfully directed to the attached formula sheet. Formula I thereof represents a carbohydrate like starch or cellulose. 1,2-dihydroxyethylene groups -CHOH-CHOH- in starch are present in position 2 and 3 in formula I. Oxidation to dialdehyde groups results in compounds of formula II. Partial oxidation as recited by claim 15 results in compounds of formulas Va and Vb.

LEROY et al. teach two embodiments of their reactions. The first embodiment utilizes starch itself, (column 2, lines 26-35; and Examples I-V). The second embodiment uses starch derivatives having hydroxyl groups in a side chain (column 2, lines 36-45, and Example VI).

LEROY et al. states that the first embodiment results in the presence of carbonyl groups. A carbonyl group (-CO-) may generally be a keto group, when the carbon atom of the carbonyl group is attached to two other carbon atoms: (-C-CO-C), or an aldehyde group, when the carbon atom is attached to one other carbon atom and a hydrogen atom: (-C-CO-H).

Leroy et al. rely on hypobromite oxidation. Hypobromite oxidation primarily leads to oxidation of secondary hydroxyl groups, at positions 2 and 3, to keto groups. This results in compounds of formulas VIa, VIb and possibly VII. Only under more vigorous conditions, which LEROY et al. avoid, will further oxidation result in dicarboxy compounds of formula III.

None of these products disclose or suggest an aldehyde group as recited in the claimed invention. In fact, LEROY et al. teach that non-terminal hydroxyl groups, e.g., those at positions 2 and 3, can only lead to keto groups and not to aldehyde groups (column 3, lines 36-40).

Only the second embodiment of LEROY et al. are aldehyde groups. However, the aldehyde groups are formed only in the side chains and not in the starch molecule itself (column 3, lines 30-44). Thus, as LEROY et al. fail to disclose or suggest that 2,3-dihydroxy groups can be oxidized to aldehyde groups, it is believed that LEROY et al. fail to anticipate or render obvious the claimed invention.

Claims 15 and 20 were rejected under 35 USC §102(b) as allegedly being anticipated by BATTISTA et al. This rejection is respectfully traversed.

BATTISTA et al. describe several distinct oxidations of cellulose. One is periodate oxidation (column 3, lines 56-64, column 4, lines 27-32) resulting in dialdehydes. These dialdehydes do not contain carboxyl groups. BATTISTA et al. 3,111,513 also identify hypochlorite oxidation and similar reagents as another suitable type of oxidation (column 5, line 32).

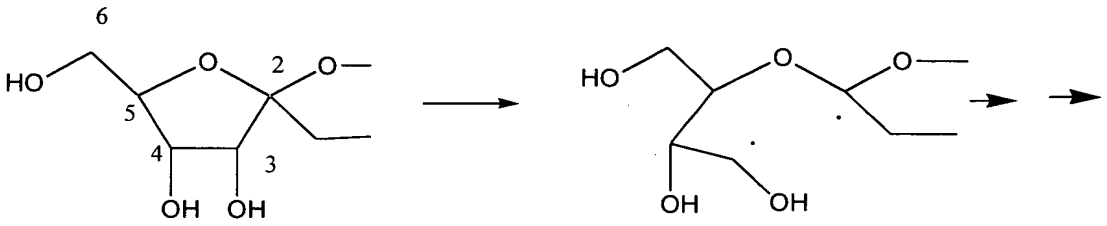
However, hypochlorite is a comparable yet less selective reagent than hypobromite as described by LEROY et al.

Its main reaction products are dicarboxy products of formula II of the enclosed formula sheet. It can also attack the primary hydroxyl group at position 6, resulting in aldehydes and eventually also carboxyls. None of these products of BATTISTA et al. exhibit aldehyde groups at the 2,3-positions of cellulose.

The Official Action concedes that the BATTISTA et al. publication does not explicitly teach the claimed ratio of the present invention. Applicants traverse the assertion that the products taught by BATTISTA et al. would inherently have the claimed ratio. As the Examiner is aware, the Official Action must provide a basis in fact and/or technical reasoning to reasonably support the determination that an allegedly inherent characteristic necessarily flows from a publication. *Ex parte LEVY*, 17 USPQ 2d 1461 (BPAI 1990). Here, it is believed that the Official Action fails to meet its burden in showing that the products taught by BATTISTA et al. would exhibit the claimed ratio. Indeed, BATTISTA et al. fail to even mention such a ratio. Thus, it is believed that BATTISTA et al. fail to disclose or suggest the claimed invention.

In the outstanding Official Action, claims 15 and 21 were rejected under 35 USC §103(a) as allegedly being obvious over SMITS et al. and LEROY et al. this rejection is respectfully traversed.

SMITS et al. refer to fructans. Fructans are structurally dissimilar to starch and cellulose in that they contain five-membered (furan-like) units instead of six-membered (pyran-like) units of starch and cellulose. As a consequence, the 2,3 position of a fructan unit is not a dihydroxyethylene unit, which would be the 3,4 position in fructans and rupture as described by SMITS et al.



Fructan Unit

Broken Fructan Unit

Thus, Applicants believe that the cited publications fail to provide any motivation to start with an oxidized carbohydrate of the periodate type (dialdehyde) and then to obtain a controllable stable product having both aldehyde and carboxyl groups in roughly a 1:1 proportion.

As a result, it is believed that the proposed combination of the SMITS et al. in view of LEROY et al. fail to render obvious the claimed invention.

In view of the foregoing remarks, therefore, it is believed that this application is in condition for allowance,

with claims 15-21 as presented. Allowance and passage to issue on that basis are accordingly respectfully requested.

Respectfully submitted,

YOUNG & THOMPSON

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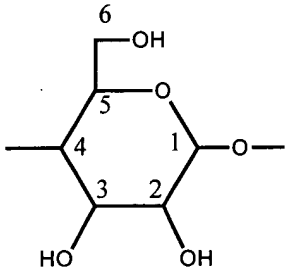
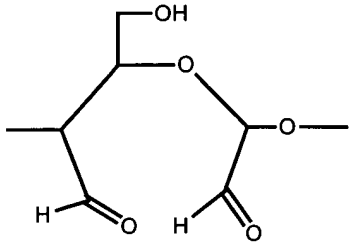
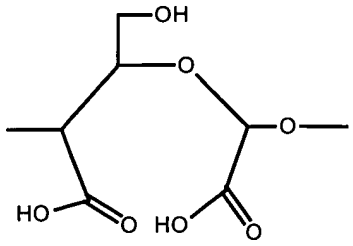
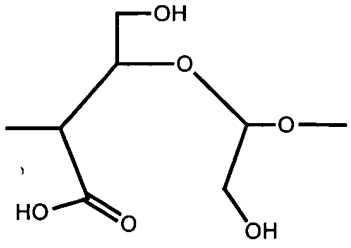
PD/bsg
Attachment:
Formula Sheet

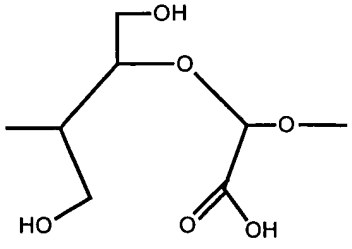
Formula Sheet

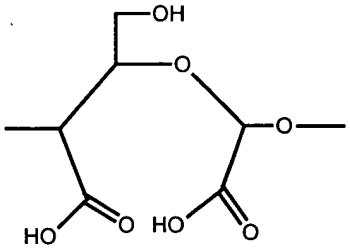
I 

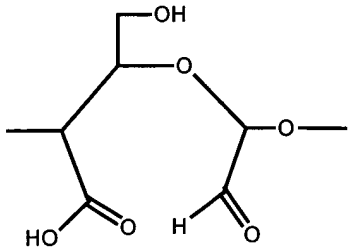
II 

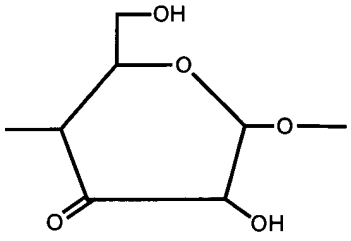
III 

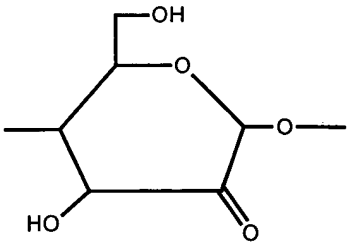
IVa 

IVb 

Va 

Vb 

VIa 

VIb 

VII